

NOT FOR PUBLICATION UNTIL RELEASED BY
THE HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON SEAPOWER AND
EXPEDITIONARY FORCES

STATEMENT OF

RADM VICTOR GUILLORY, U.S. NAVY
DIRECTOR OF SURFACE WARFARE

AND

RADM WILLIAM E. LANDAY, III
PROGRAM EXECUTIVE OFFICER SHIPS

AND

MS. E. ANNE SANDEL
PROGRAM EXECUTIVE OFFICER LITTORAL AND MINE WARFARE

BEFORE THE

SUBCOMMITTEE ON SEAPOWER AND EXPEDITIONARY FORCES

OF THE

HOUSE ARMED SERVICES COMMITTEE ON
THE CURRENT STATUS OF THE LITTORAL COMBAT SHIP PROGRAM

MARCH 10, 2009

NOT FOR PUBLICATION UNTIL RELEASED
BY THE HOUSE ARMED SERVICES COMMITTEE
SUBCOMMITTEE ON SEAPOWER AND
EXPEDITIONARY FORCES

INTRODUCTION / REQUIREMENT

Mr. Chairman, distinguished members of the Subcommittee, thank you for the opportunity to appear before you today to address the Navy's Littoral Combat Ship (LCS) program. We thank the Committee for its continued support and active interest in Navy shipbuilding programs.

The Navy remains committed to the LCS program. LCS fills warfighting gaps in support of maintaining dominance in the littorals and strategic choke points around the world. The Navy remains committed to procuring 55 LCSs, and is aggressively pursuing cost reduction measures to ensure delivery of future ships on a schedule that affordably paces evolving threats. This will be accomplished by matching required capabilities, to a recurring review of warfighting requirements through applying lessons learned from the construction and test and evaluation periods of seaframes and mission packages.

The LCS program is structured in flights of seaframes and spirals of mission packages. This allows the relatively rapid change in technologies and threats associated with the modular mission packages to be continuously improved through incremental upgrades without major design impacts to seaframes. The result is a program that minimizes the risks of a highly interdependent system of systems by decoupling seaframe procurement from mission package procurement. This allows continuous cost efficient delivery of state-of-the-art capability to the warfighter via new mission package upgrades.

The LCS program capabilities address specific and validated capability gaps in Mine Countermeasures (MCM), Surface Warfare (SUW) and Anti-Submarine Warfare (ASW). The Concept of Operations and design specifications for LCS were developed to meet these gaps with focused mission packages that deploy manned and unmanned vehicles to execute a variety of missions. LCS's inherent characteristics (speed, agility, shallow draft, payload capacity, reconfigurable mission spaces, air/water craft capabilities) combined with its core Command, Control, Communications, Computers and Intelligence (C4I), sensors, and weapons systems, make it an ideal platform for hosting additional Maritime Strategy mission areas, such as Irregular Warfare and Maritime Security Operations.

The Navy, as part of its annual review of its shipbuilding program, expects there will be sufficient force structure with our existing frigates and mine warfare ships until LCS delivers in quantity to meet overarching deployment requirements.

Legacy mine warfare ships and frigates are planned to be phased out gradually. These decommissionings will be balanced with LCS mission package and seaframe deliveries to mitigate warfare risks.

LCS 1, USS FREEDOM, was delivered to the Fleet on September 18, 2008 — six years and one day after the program was established. LCS 2, the future USS INDEPENDENCE, was christened in Mobile, AL, on October 4, 2008. Later this year the program will have delivered a second ship of a completely different design.

While the initial cost and schedule objectives for the program were overaggressive, they did provide the tension and urgency for these achievements. Although the concurrent design and

construction of LCS revealed challenges for meeting the original cost and schedule objectives, the Navy will apply lessons learned to this program as well as other shipbuilding programs.

At the Subcommittee's request, the Navy is pleased today to discuss an overview of the history of the LCS program, the current status of LCS 1 and LCS 2, and the future acquisition strategy for the LCS program.

BACKGROUND

The LCS acquisition strategy, approved in May 2004, was based on the tenets of modular and open system architecture, Cost-As-an-Independent-Variable design process, a rapid construction cycle and continuous competition at all levels of the program. The Navy awarded contracts for construction of the first four LCS seaframes, with Lockheed Martin (LM) and General Dynamics (GD) awarded two ships each. Fabrication of LCS 1, the first LM ship, began in February 2005 and the ships delivered in September 2008. Fabrication on LCS 2, the first GD ship, began in November 2005 and this ship will deliver this year. LCS 3 and 4 options were exercised in June and December 2006, respectively.

Cost growth on both variants resulted in a detailed assessment of program cost and structure. The Navy sought to restructure the contracts for LCS 3 and 4 to fixed-price incentive terms to more equitably balance cost and risk, but could not come to terms and conditions that were acceptable to both parties. On April 12, 2007, the Navy terminated construction of LCS 3 for convenience under the Termination clause of the contract. On November 1, 2007, the Navy terminated construction of LCS 4 for convenience under the Termination clause of the contract. Based on program restructuring, the Navy requested and received congressional approval to reprogram FY 2007 shipbuilding appropriations to fund cost increases on LCS 1 and 2.

At the direction of Assistant Secretary of the Navy for Research, Development, and Acquisition (ASN(RDA)), the LCS program underwent a thorough independent assessment to review the cause of the cost growth and evaluate the way forward.

The results of that assessment identified a number of factors key to the program's poor performance. The Navy has actively addressed those key findings in the program as it operates today:

- The design for both ships is mature and we are incorporating revisions to specific areas based on the lessons learned from the construction of the initial ships, proposed production improvements, acceptance inspections and the early stages of the post delivery testing period. Those revisions will be in place for the start of construction of the FY 2009 ships.
- The Navy has increased the staff assigned in the program office and at the shipyards to monitor performance. The program office staff has grown from eight to 20 civilian personnel, focusing on critical production, acquisition, and financial management specialties. An additional 12 billets have been assigned as the two lead ships complete delivery and post delivery milestones this year and more ships are placed under contract.

Military staff has increased from three to five assigned. Officers with new ship construction experience were assigned to the program manager and production manager positions.

- The Supervisors of Shipbuilding doubled the staff at each LCS shipbuilder. Focusing resources to the waterfront, the program office works closely with the Supervisors to sustain a daily drumbeat in monitoring production progress on these lead ships, identifying and monitoring key metrics that maintain progress to key events.
- To improve technical decision making and reduce the time to resolve technical issues, especially as related to the application of Naval Vessel Rules, the program office and the Naval Sea Systems Command Chief Engineer have placed senior managers and technical authorities on the waterfront.
- New performance baselines were implemented for each contract to help monitor and control cost, with contracting incentive structures to support improved progress. We continue to work closely with the industry teams to improve their performance and Earned Value Management System measurement and reporting capabilities.
- The FY 2009 and FY 2010 contracts will be fixed-price contracts to ensure cost and schedule adherence remain a primary focus of both the industry and the government program teams.

AFFORDABILITY

The Navy has implemented a comprehensive cost-reduction program for LCS. Taking advantage of lessons from other shipbuilding programs' affordability initiatives such as the DDG 51 value engineering program, the T-AKE "take cost" program and the Virginia-class cost-reduction initiative, this ongoing effort seeks to reduce acquisition cost and total ownership cost through continuous assessment of operational and technical requirements, improvement of production processes, and implementation of acquisition strategies that will lead to stable production and improved purchasing leverage. Examples of areas under review by this program include:

- A joint team of industry, government and independent experts have conducted a "stem-to-stern" inspection of each ship to identify areas of inefficiency or where alternative production methods can improve production efficiencies.
- The Navy implemented a Total Ownership Cost (TOC) reduction review jointly overseen by the ASN(RDA) and Vice Chief Naval Operations to look for improvements in total lifecycle costs.
- The Navy has initiated a second study to look at the Total Ownership Cost return on investment of a common combat system. The initial study conducted in 2007 did not support a payback sufficient to support the upfront integration and additional

procurement costs. The Navy's development of its objective architecture for combat systems provided a different set of assumptions to be considered for this new study.

- Finally, infrastructure improvements are either under review or in progress at both yards that will improve production efficiencies and reduce costs.

CURRENT STATUS OF LCS 1 AND LCS 2

USS FREEDOM (LCS 1)

USS FREEDOM was built by the Lockheed Martin-led team at the Marinette Marine shipyard in Marinette, WI, and was commissioned on November 8, 2008. Due to restrictions on some testing in the Great Lakes, acceptance testing was broken into two phases. Acceptance Trial 1 (AT) evaluated the ship, propulsion, navigation and some communications. Acceptance Trial 2 will evaluate the remaining communications and most of the combat systems. In August 2008, the Navy's Board of Inspection and Survey (INSURV) conducted Acceptance Trial 1 on LCS 1 and found the ship to be "capable, well-built, and inspection-ready," and recommended that the Chief of Naval Operations authorize delivery of the ship following the correction or waiver of cited material deficiencies, a standard practice in Navy shipbuilding.

During inspection, INSURV identified 21 "starred" deficiencies onboard LCS 1. This is a relatively low number and compares favorably to other first-of-class ships. The Navy developed a plan to address these deficiencies in a timely, prioritized sequence – 12 were closed prior to delivery, five more will be closed during the ship's current Industrial Post Delivery Availability, and the final four will be closed during Post Shakedown Availability (PSA) in FY 2010.

After acceptance, the crew conducted a vigorous shakedown of the ship during her transit from the building yard to Norfolk, VA. Encountering adverse weather and numerous instances of challenging ship handling evolutions, the crew reported the ship performed superbly during the 2,400 mile journey. LCS 1 will undergo AT 2 and additional test and trials period intended to complete certifications and mission package integration testing.

INDEPENDENCE (LCS 2)

INDEPENDENCE is being built by the General Dynamics team at the Austal USA shipyard in Mobile, AL. She was christened on October 4, 2008, and is expected to deliver in 2009, with Initial Builder's Trials and Acceptance Trials to complete prior to ship delivery. Following delivery and commissioning, LCS 2 will transit to Norfolk, VA, and conduct a post delivery test and trials period similar to FREEDOM.

Facing similar lead ship challenges on INDEPENDENCE, Navy leadership directed General Dynamics to take a phased approach to completing the ship. The initial phase prioritized efforts on that scope of work required to safely take INDEPENDENCE to sea, demonstrating propulsion and additional systems and components necessary for communications and safe navigation. Based on performance to this goal, a second phase of work would be authorized focusing on only those core combat systems necessary to demonstrate a basic detect-to-engage capability required

during an acceptance trial. The third phase is the remaining systems and components required to demonstrate complete combat systems and communications capabilities of the complete sea frame. At this time, the program manager has authorized phase 1 and 2 work. Phase 3 remains contingent on performance of the first two phases. It is still the program manager's intention to present a complete ship to INSURV at acceptance trial.

The Navy monitors progress through daily assessments, weekly analysis of key metrics on production and test progress, and conducts monthly progress and cost reviews with the contractor to ensure that corrective actions are implemented and effective. As of February 2009, all four of the ship's generators have been started and vital shipboard electrical systems have completed initial testing, aligning with current schedule projections for ship delivery. The program expects to achieve main propulsion engines light-off in April and May, with a goal of Builder's Trials in late June. The program is prudently managing resources to be able to address any potential challenges.

Status of Mission Package Procurement

The modular open system architecture used for the LCS design allows independent development of seaframes and mission packages that integrate across a controlled interface specification to ensure complete interoperability. This allows the relatively rapid change in technologies associated with the modular mission packages (MPs) to be continuously improved through incremental upgrades without major design impacts to seaframes. The result is a program that minimizes the risks of a highly interdependent system of systems by decoupling seaframe procurement from mission package procurement, and allows continuous cost efficient delivery of state-of-the-art capability to the warfighter via new mission package upgrades.

The underlying strength of the LCS lies in its innovative design approach, applying modularity for operational flexibility. Fundamental to this approach is the capability to rapidly install interchangeable mission packages into the seaframe. The ability to modify the LCS physical configuration with different MPs in less than a 96-hour period gives the operational commander a uniquely flexible response to changing theater warfighting requirements. This also allows the LCS warfighting capability to quickly adapt to evolving threats, using improved technology. To achieve this flexibility, the Navy is developing and procuring specific numbers of MPs to meet the Fleet's warfighting requirements. A mission package consists of mission systems which are integrated to form mission modules, Sailors organized into mission module and aviation crew detachments and supporting aircraft. Each mission package provides warfighting capability for one of three focused mission areas:

- Mine Countermeasures (MCM)
- Surface Warfare (SUW)
- Anti-Submarine Warfare (ASW)

The first SUW and ASW mission packages were rolled out in FY 2008 and joined the first MCM mission package, which was delivered in FY 2007. Land-based and at-sea testing of mission package components began in FY 2008 and continues in FY 2009. Through an Integrated Test and Evaluation framework, the LCS Mission Modules program office is working very closely with the responsible mission systems program offices in Naval Sea Systems Command, Naval Air Systems Command and the Army to ensure that all Mission System Program of Record, as

well as LCS shipboard testing events, demonstrates required warfighting effectiveness and suitability. Formal LCS sea frame testing of mission packages commences in FY 2009 and continues through FY 2012.

The LCS Mission Modules program office has adopted an open business model that leverages Participating Acquisition Resource Managers' (PARMs) developmental efforts for both program-of-record and non-program-of-record systems and components. This process minimizes LCS Mission Modules program investments of research and development dollars required to mature unique technologies. In addition, the process allows for package procurement flexibility by limiting integration of immature technologies/systems. This is done by continuous evaluation of system maturity through a disciplined system engineering framework. Through this open business model, the LCS Mission Modules program procures mature mission systems from PARMs and then engages an industry partner for Package Production and Assembly (PP&A) of mission packages.

FUTURE ACQUISITION STRATEGY FOR THE LCS PROGRAM

LCS Acquisition Strategy

In October 2008, the Undersecretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)) approved a revised acquisition strategy for LCS to cover procurement of the FY 2009 and FY 2010 ships. The updated acquisition strategy combines the FY 2009 procurement and FY 2010 options in order to maximize competitive pressure on pricing as a key element of cost control. Increasing the quantity solicited by adding the FY 2010 ships to the FY 2009 solicitation as options will also enable industry to better establish longer term supplier relationships and offer the potential for discounting to the prime contractors and subcontractors. FY 2010 ship options will be a competition for quantity.

Acquisition strategies for FY 2011 and outyear ships are under development. The Navy's strategy will be guided by cost and performance of the respective designs, as well as options for sustaining competition throughout the life of the program. Evaluations of combat systems and hull, mechanical and electrical (HM&E) performance will be conducted throughout those tests and trial periods and, as was mentioned earlier, we are already looking for opportunities to reduce total ownership costs through commonality, reductions or consolidations based on return-on-investment analysis.

FY 2009 and FY 2010 Contract Awards

As a result of congressional direction contained in the FY 2009 Defense Appropriations Act, the Navy amended the LCS seaframe construction solicitation to delete the FY 2008 ship. This amended solicitation continues the competition between the two incumbent industry teams. The Navy may award one ship to each industry team in FY 2009 and intends to hold a competition for the FY 2010 option ships soon after award of the FY 2009 contracts. Affordability remains a key tenet of the LCS program as the Navy works with industry to provide this capability for the lowest cost.

The FY 2009 and FY 2010 awards will be fixed-price incentive contracts, with the Navy anticipating that each LCS prime contractor receives one ship in FY 2009. The Navy remains committed to effective cost control and has modified contracting strategies and management practices to provide program stability. The FY 2009 and FY 2010 ships will be designated as Flight 0+ and will include only existing approved engineering changes along with improvements to construction or fabrication procedures. The Navy will incorporate further lessons learned from LCS 1 and 2 sea trials into the FY 2009 and FY 2010 ships prior to production. Any such changes will be limited to those essential for safety, operability or affordability. Furthermore, the RFP requests that the proposals for the FY 2010 option ships include alternative prices for both a full-up ship and separately priced contract line item numbers (CLINs) for a core seaframe (only systems for safe operation at sea), core combat system and individual combat systems and equipments (such as the gun or radar). This allows us the opportunity to manage the integration of the combat systems separately if that proved to be more affordable.

In the interim prior to FY 2009 contract awards, both industry teams were authorized and funded to pursue limited design and construction efforts while source selection proceeded. The scope of these efforts was carefully coordinated with prime contractors with an eye on preserving critical shipbuilding skills or to improve production process engineering. Once the FY 2009 ships are awarded, these sustaining efforts will be subsumed in the shipbuilding contracts.

Mission Modules Acquisition Strategy

At the time of its inception in FY 2004, the Mission Modules program office decided to utilize government labs to build the first two of each type of mission package. The Navy Labs (Naval Surface Warfare Center Panama City (NSWC PC), Naval Undersea Warfare Center Newport (NUWC NPT), SPAWAR Systems Center San Diego (SSC SD) and Naval Surface Warfare Center Dahlgren (NSWC DD)) are developing, integrating, testing and delivering the first six mission packages. This approach was implemented to ensure responsiveness to refined requirements and reduce the financial risk to the Navy associated with cost-type contracts for this unique concept. This strategy has been very advantageous to the Mission Modules program. Once these initial mission packages are completed by the warfare centers, the package production and assembly will transition to Northrop Grumman.

Following a competitive solicitation, Northrop Grumman was awarded a contract in January 2006 to provide a range of package production and assembly functions specified by the Navy. The contract contains Award Fee/Award Term provisions covering a term of up to ten years, with contract options exercised annually. Awarding the options is contingent on continued excellent contractor performance in preceding years, and is assessed annually.

As Northrop Grumman steps into a production and assembly role, the Navy labs will transition into the Technical Direction Agent and In-Service Engineering Agent role. This transition began in 2008 with the transfer of the Technical Data Packages from the Navy labs to Northrop Grumman in 2008 and continues in 2009.

Rights in Technical Data and Computer Software

It is the Navy's legal and contractual position that the Navy has Government Purpose Rights (GPR) to the seaframe designs of both LCS variants and, as such, can solicit full and open competition for either seaframe design after an adequate design package for such a competition is developed.

For clarity, those rights are as follows:

- Seaframe – The government has GPR to the design of both seaframes. We did not seek the rights to the individual equipments in the seaframe (for example we do not have GPR to the Rolls Royce engine that we could provide to another engine manufacturer to produce for the government). Another shipbuilder or the government would have to contract with the individual equipment manufacturers for fabrication and delivery of the equipment for shipboard installation or, alternatively, negotiate a license with the individual equipment manufacturers based on the equipment, specifications and interfaces detailed in the seaframe design.
- Combat Systems – We have GPR to the technical data pertaining to the LM combat systems, architecture and interfaces. It currently resides in our shared repository. The GD Integrated Combat Management Systems (ICMS) is based on the Thales TACTICOS system for which Northrop Grumman is the sole U.S. licensee. Another shipbuilder or the government would have to either enter into a contract with Northrop Grumman for production and delivery of the ICMS or, alternatively, obtain a license for that system from Northrop Grumman. As with the seaframe, we do not possess GPR to the specific equipments for either system such as the gun, electronic warfare system or radar. .

Any third parties seeking to compete on LCS would need to either contract directly with the equipment manufacturers for fabrication and delivery of the required equipment and associated software or, alternatively, negotiate licensing agreements for the equipment and software with the respective vendors. This is similar to the current approach in place with the LM and GD teams. An alternative approach would be for the government to contract directly with the equipment manufacturers and provide the equipment and software to the shipbuilder as Government Furnished Equipment/Government Furnished Information.

LCS “Build-to-Print” Design Concept

To implement a competitive “build-to-print” seaframe acquisition, there remains a significant effort to finalize those revisions to the design that have resulted during construction, as well as lessons learned from LCS Flight 0 production improvement initiatives, developmental/operational testing and at-sea testing. There is a considerable amount of work necessary to convert a design package developed by a specific shipyard based on its own particular production capabilities and processes to one that can be provided to another qualified shipbuilder as a government furnished design.

The amount of effort necessary to prepare the LCS data packages to support a full and open competition derives from the structure of the initial LCS acquisition strategy. The foundation of the LCS procurement is not a traditional detailed drawing package but the Navy-established requirements detailed in the Capabilities Development Document (CDD). Each industry team

developed from the CDD a Specified Performance Document (SPD) that describes the required performance to meet the CDD requirements, then a build specification detailing how to build a ship to meet that performance. From these three documents, drawings and specifications detailing exactly what to construct were then developed. The contractual technical baseline is defined by the CDD, SPD and the build specifications, not the drawings. Configuration management is accomplished at the build specification level.

At present in the LCS acquisition, industry has developed drawing packages for LCS 1 and LCS 2. These include digital product models, extracted drawings and drawing liens, representing multiple changes accomplished to the drawings during production. Thus, while appropriate for use in construction by the existing industry teams, these packages were not envisioned to be used as the foundation documents for a build to print solicitation. It would not be prudent to pursue a build-to-print contract for the current design package until it fully reflects those changes.

The Navy's FY 2009 budget request did request funds to begin refinement of the Flight 0+ baseline design drawings and associated documentation into detailed production drawings and documents. These drawings will also incorporate production, assembly and fabrication lessons learned from the previous seaframes as well as operator feedback from the seaframe and mission package crews obtained during the testing and trials period. Additional time and resources will be necessary to complete a build-to-print package.

The build to print package requires the development of a neutral-format computer-aided design model (both 2-D and 3-D and STEP compliant) for the total ship, clearing all interferences for the model, and review and update of all additional required documentation to ensure that requirements are sufficiently detailed and "generic" to enable providers other than the incumbent to bid (e.g., the design can't reflect six-inch bent pipe if only the incumbent has facilities sufficient to accomplish this). The timing for completion of such a drawing package is dependent on completion of testing for the LCS lead ships. LCS 1 must complete Acceptance Trials 2 in Spring 2009 as well as seaframe developmental testing/operational testing or integration testing with mission packages. LCS 2 has not been delivered and must complete a similar test and trials period. The Navy is developing an estimate for LCS class design services needed to support this maturation.

Furthermore, to implement a full-and-open acquisition targeted at gaining increased access to additional shipyards, an approach must also be developed for the acquisition of the combat systems/networks/control systems/C4I equipment. To mitigate this risk for combat systems efforts under a build-to-print acquisition, the Navy would either need to direct the shipyards to contract with the current primes as subcontractors, or assume the role of providing the combat systems/networks/control systems/C4I equipment as GFE and develop the infrastructure necessary to serve as the integrator for the program.

LESSONS LEARNED

The Navy has incorporated many of the lessons learned from the initial LCS ships into overall acquisition policy and in specific shipbuilding programs.

On February 26, 2008, the Navy issued SECNAVNOTE 5000, which instituted an Acquisition Governance Improvement Six-Gate reporting, reviewing and oversight process that provides specific criteria for areas such as requirements, funding, and technical performance including a Probability of Program Success (PoPS) tool. This new process ensures that the various stakeholders from the resources, requirements and acquisition communities address and revisit at defined intervals, issues associated with technical maturity, affordability and program health.

Guidance emphasizing the use of independent engineering technical review boards and responsibility for Configuration Steering Boards to monitor requirements changes has been promulgated.

Initiatives to expand the size of the acquisition workforce and to evaluate the composition and experience of program offices are underway. Similar initiatives are underway in the technical and SUPSHIPS areas.

A rigorous production readiness review (PRR) prior to the start of fabrication is in place for shipbuilding programs. It was utilized for the start of fabrication for the DDG 1000, and will be used in the Joint High Speed Vessel (JHSV) program as well as the FY 2009 LCS ships.

A critical aspect of the PRR is design maturity. DDG 1000 requirements were that the design was at least 85% complete prior to start fabrication, including all units scheduled to start construction in the first six months. Similar criteria will govern the start of fabrication for JHSV and subsequent new ship designs.

SUMMARY

In summary, the Navy remains committed to the LCS program. LCS remains a critical warfighting requirement for our Navy to maintain dominance in the littorals and strategic choke points around the world.

The Navy continues to address the problems encountered in the early stages of the program and to implement improvements across the entire shipbuilding portfolio. We appreciate your strong support and the opportunity to testify before the Subcommittee. We will be pleased to answer any questions you may have.